

60. (Original) The method according to Claim 54, wherein the oxide precursor comprises at least one soluble inorganic metal salt.

61. (Original) The method according to Claim 54, wherein the step of forming the ceramic composite into the ceramic composite article comprises at least one of cold pressing the ceramic composite, hot pressing the ceramic composite, isostatically pressing the ceramic composite, slip casting the ceramic composite, and spraying the ceramic composite to form the ceramic article.

62. (New) The method according to Claim 47, wherein the group IVB metal oxide comprises at least one oxide selected from the group consisting of hafnia, zirconia, and combinations thereof.

#### **REMARKS**

In the Office Action, claims 47-61 are rejected, claims 1-46 are withdrawn from consideration. Claims 1-61 are pending in the present patent application. In this response claims 47 and 54 have been amended, and a new claim 62 is introduced. Reconsideration and allowance of all pending claims are requested.

#### **Specification**

Applicants respectfully submit that paragraphs [0041] and [0042] have been amended to correct “crystoballite” to “crystobalite” as suggested by the Examiner.

#### **Claim Amendments**

The October 30, 2006 office action has been carefully considered. After such consideration, claims 47 and 54 have been amended. The claims are amended to recite nanoparticles comprising at least one IVB metal oxide.

### Claim Rejections

Claims 47-60 are rejected as being anticipated by Chao et al., U.S. Patent Application No. 2003/0152759 (hereafter "Chao"). A prima facie case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. In re Donohue, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Claim 61 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Chao in view of Pham et al., U.S. Patent No. 6,548,440 (hereafter "Pham"). Applicants respectfully request favorable reconsideration in light of the above amendments and the following remarks.

Amended claims 47 recites a method of making a ceramic composite that is thermally and structurally stable upto about 1000°C, comprising a mesoporous matrix and nanoparticles comprising at least one group IVB metal oxide. The mesoporous matrix comprises a ceramic matrix and has a plurality of pores dispersed therethrough. The plurality of pores form a mesoporous network, and an array of ceramic nanoparticles templated within the mesoporous network, wherein the ceramic nanoparticles comprise at least one group IVB metal oxide, and each of the plurality of ceramic nanoparticles has at least one dimension of less than about 100 nm. The array forms an ordered structure within the mesoporous network. The method comprises the steps of: providing a ceramic matrix material; forming a templated mesoporous network within the matrix material, wherein the mesoporous network has a controlled pore size; infiltrating the templated mesoporous network with an oxide precursor; and converting the oxide precursor into inorganic nanoparticles within the templated mesoporous network to form the ceramic composite. Support for the claim amendment may be found in the disclosure, for example in paragraph [0028] and in the examples 1 and 2.

Applicant respectfully submits that Chao does not anticipate the amended claim. Chao does not disclose a ceramic composite wherein the ceramic nanoparticles comprise at least one group IVB metal oxide as claimed herein. Chao discloses a method of fabricating nanostructured materials in functionalized mesoporous materials. The process involves functionalizing the mesoporous materials to bear charged functional groups on

the pore surface of mesoporous host, followed by mixing the functionalized host with oppositely charged molecules to form nanostructured materials. Chao has disclosed nanoparticles of metals such as Pt, intermetallics such as PdAg, and metal oxides such as Fe<sub>2</sub>O<sub>3</sub>. There is no reference in Chao on nano particles of at least one group IVB metal oxide.

Because Chao does not disclose each and every limitation of the Applicants' claimed invention, the rejection of claims 47-61 may not properly be made under 35 USC 102(e). In particular, the reference fails to teach, suggest, or disclose method to fabricate nanocomposites "comprising at least one group IVB metal oxide." Thus, the Applicants respectfully request that the rejection of claims 47-61 under 35 USC 102(e) as anticipated by Chao be withdrawn. Independent claim 54 and its depended Claims 55-61 are believed to be allowable for the same reasons as Claim 47. Favorable reconsideration is requested.

Finally, new claim 62 depends from claim 47, which is believed to be allowable for the reasons described above. Prompt allowance of this claim is respectfully requested.

### Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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